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TRANSMITTAL OF APPEAL BRIEF (Large Entity)	Docket No. 90041.97R074(CSD

In Re Application Of: **Robert K. Riffee**

OIPE JC26 FEB 0 6 2003 PATENT & TRADEMARK OFFICE

Serial No.	Filing Date	Examiner	Group Art Unit
08/800,574	February 18, 1997	Richard J. Lee	2613

Invention: **NARROWBAND VIDEO CODEC**

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TO THE ASSISTANT COMMISSIONER FOR PATENTS:

Transmitted herewith in triplicate is the Appeal Brief in this application, with respect to the Notice of Appeal filed on **August 9, 2002.**

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Dated: 1/31/03

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Serial No. 08/800,574	Filing Date February 18, 1997	Examiner Richard J. Lee	Group Art Unit 2613
Invention: NARROWBAND VIDEO CODEC			

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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicant:	Robert K. Riffee	)	Examiner: Lee, Richard J.
Serial No.:	08/800,574	)	
Filed:	February 18, 1997	)	Art Unit: 2613
For:	NARROWBAND VIDEO CODEC	)	

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APPEAL BRIEF (REVISED)

In response to the office action mailed 12/31/02, Applicant submits this Appeal Brief (Revised) in triplicate.

1. Real Party in Interest

The Real Party in Interest is Harris Corporation, having a place of business at 1025 West NASA Boulevard, Melbourne, Florida, 32919.

2. Related Appeals and Interferences

There are no related appeals or interferences.

3. Status of Claims

Claims 1-30 are pending, all claims are rejected and all claims are appealed.

4. Status of Amendments

There are no amendments after final.

5. Summary of Invention

Modern military operations now require real time two way digital video communications. A video codec (coder, decoder) converts video images into digital signals and vice versa. Present video codecs are large, power hungry, and complex. Such codecs are

used at video conferencing facilities and are typically housed in a controlled environment of an office building. Large and complex devices are both inappropriate and virtually useless for military operations, especially combat operations. Accordingly, there is a need for a compact and efficient codec to transmit real time color video with audio over existing tactical communication links, in particular radio frequency (rf) links.

The invention provides a solution to the problem by providing a tactical military narrowband video codec 10 that transmits real time color video and audio over rf communication links. The narrowband video codec has a small chassis, is battery powered, and performs real time video and audio compression and decompression, forward error correction, and digital data transmission via tactical radios. The codec operates in a half-duplex or full-duplex mode and interfaces with a variety of standard video and audio signals.

The narrowband video codec 10 (Fig. 1) generates an output stream of control, data, and error correction bits. The codec frames the stream of bits into a series of sequential frames of bytes for transmission over an RF link of a controlled frequency. Each frame (Figs. 7a-7d) comprises an identical sequence of bytes and includes, in sequence, two control bytes, a plurality of sequential sets of data bytes and a plurality of error correction bytes. The data bytes include repeated sets of audio and video bytes. Each set of the data bytes has the audio and video bytes in the same order as each other set of data bytes in the frame. In particular, each set of data bytes has the same number of video bytes between sequential audio bytes. Each byte includes eight bits of data. The Frame Structure is described in detail at pages 15-17 of the specification.

The narrowband video codec has a first digital signal processor 304 for handling transmitted video information. The DSP 304 converts analog video signals into digital video signals and compresses the digital video into video bytes. A second digital signal processor 404 handles reception of video digital signals. It decompresses digital video bytes into digital video signals and converts decompressed digital video signals into analog video signals. A third digital signal processor 504 handles both transmission and reception of audio. For transmission it converts analog audio signals into digital audio signals and compresses the digital audio signals into audio bytes. For reception it decompresses the audio bytes into digital audio signals and converts the decompressed digital audio signals into analog audio signals. The

invention also provides control and error correction bytes, software and hardware. See Figs. 7a-7d and pp. 15-17.

The invention is a unique combination of hardware and software. It uses separate DSPs to process video input and output and one DSP to process audio. By separating audio from video data, each DSP can operate at optimal efficiency for the type of data (audio or video) that it handles. The invention arranges data into a unique frame structure. Each frame comprises a number of bytes. Each byte includes data of only one type: control, audio, video or error correction. The structure, once chosen, is the same for all frames. It is particularly characterized by one audio byte followed by a set number of video bytes.

In each sequential frame the number of video bytes following the audio byte is the same. As such, the system knows that the next byte after a set number of video bytes will be an audio byte. The system routes the audio bytes to or from the audio DSP 504. An audio algorithm compresses and decompresses the audio bytes. However, the video bytes are handled separately by two DSPs that use algorithms specially tailored for compression or decompression of video data signals. In this way the invention simultaneously uses two or more different algorithms to compress and decompress the audio and video data signals. Regardless of the compression or decompression algorithm, all data bytes have the same number of bits and are treated the same by the rf link.

The invention is claimed in three independent claims and twenty-seven dependent claims. Claim 1 is one independent claim; claims 2-8 depend ultimately from claim 1. Claim 9 is a second independent claim; claims 10-28 depend ultimately from claim 9. Claim 29 is a third independent claim and claim 30 depends from claim 29.

Claim 1 defines the invention in terms of its frame structure for the transmitted and received bytes. That structure is the same for all frames and includes, in sequence: two control bytes, a plurality of sequential data bytes with an audio byte followed by a video bytes, and a plurality of error correction bytes. The audio and video bytes are the same order in each set of data bytes. Claim 2 limits the video

bytes to the same number in each frame. Claim 3 further defines the role of the control byte as including information about the number of bytes in each frame. Claim 4 provides for periodically refreshing the compressed video image. Claim 5 provides for variable error correction and claim 6 synchronizes the frames to the radio frequency link. The battery and its voltage are defined in claims 7 and 8.

Dependent claims 9-18 define the detailed frame structure for the bytes. Those claims are designed to cover, *inter alia*, features of the table found on page 17 of the specification. These claims define the individual species of the generic byte arrangement of Claim 1. Certain claims cover the detailed separation of audio bytes by set numbers of video bytes. See, for example, claims 13 and 16.

Independent claim 19 defines the invention in terms of its separate DSPs. There is one DSP for receiving and decompressing video, one for transmitting and compressing video and one that receives, decompresses, transmits and compresses audio.

Dependent claims 20 and 21 define the battery supply and are similar to claims 7 and 8.

Dependent claims 22-28 further define the invention in terms of its radio frequency features. These include its ability to randomize and derandomize data (claims 24, 25) and different modes of clarity (claims 25-28) that let the user select whether to optimize operation for audio or video and for the level of desired video performance.

Independent claim 29 is similar to claim 19 and includes the further feature of multiple compression and decompression algorithms on each DSP. Claim 30 selects a default audio conversion program in accordance with the data rate of the radio frequency link.

6. Issues

The only issue is whether the invention is patentable over the combinations of references of record.

7. Grouping of Claims

Claims 1, 3, 6, 7, and 8 stand or fall together.

Claims 19-28 stand or fall together.

Claims 29 and 30stand or fall together.

Claims 2, 4, 5, and each of 9-18 are independently patentable and each stands alone.

8. Argument

Claims 1-6 and 9-18 are rejected under 35 USC 103(a) as being unpatentable over Kuzma (US 5389965) in view of Yurt et al. (US 6002720) and Paneth et al. (US 5119375). The rejection alleges that Kuzma shows all the elements of Claim 1 except for the defined byte sequence in a frame, sending frames over and RF link and the particular byte sequences set forth in Claims 9-18. Applicant disagrees.

The rejection is erroneous because the reference it relies upon (Yurt) fails to show or suggest "a sequence of at least one audio byte and a plurality of video bytes, at least one of said plurality of video bytes between each sequential audio byte, each set of data bytes having its audio and video bytes in the same order as each other set of data bytes." Yurt does not place audio and video bytes in a frame. Instead, Yurt separates the audio and video bytes into their own separate audio and video frames. All bytes in a given frame are the same type of data, i.e., audio or video, but not both. In contrast the invention mixes both audio and video bytes in each frame.

The rejection is erroneous because Yurt does not show a byte sequence arrangement that includes the order of bytes set forth in the claims. Yurt, at most, shows a series of frames. It does not go within a frame to show the bytes that make up the frame. It does not have to do so because all bytes in a Yurt frame are for the same kind of data, audio or video, but not both. Yurt does not show the frame structure of the invention.

The Board's attention is directed to column 18, lines 59-63. The rejection relies upon that section to reject Claim 1. There Yurt describes Fig. 8D as follows:

> Fig. 8D shows a block representation of for [sic] three illustrative items which may be stored in the source material library 111. Each of the items 1-3 contains its own arrangement of video ***frames*** 812, audio ***frames*** 822, and data ***frames*** 832. (Emphasis added)

A frame of data includes bytes (words) that are in turn made up of bits (ones or zeros). Yurt does not include video and audio bytes in a common frame. Instead, Yurt separates audio frames from video frames. Claims 1-6 and 9-18 require a frame with an audio byte followed by a plurality of video bytes. That frame structure is not shown or suggested in Fig. 8D of Yurt. The specification of Yurt does not support the rejection. It relies upon Fig. 8D to show that bytes within a given frame are separated by other types of bytes. However, Fig. 8D does not show or suggest bytes in a frame. In contrast, Fig. 8D shows the structure for a series of frames. The Yurt reference, by its own terms, shows that Fig. 8D does not illustrate bytes in a frame but rather illustrates sequential frames. Accordingly, the use of Fig. 8D to reject Applicant's claimed sequence of bytes is clearly erroneous because is Fig. 8D shows only a sequence of frames.

The particular byte sequence of Claim 2 is also not shown or suggested by Yurt. As such, claim 2 is independently patentable over Yurt.

Claim 4 is also independently patentable over the art or record. The subject matter of Claim 4 is not shown or suggested by the art of record. The rejection relies upon Fig. 2 of Kuzma to show periodic refreshment of the image. However, Fig. 2 in Kuzma does not show such a feature and thus the rejection is erroneous. Kuzma is silent about refreshing the image.

The subject matter of Claim 5 is not shown or suggested by Kuzma. The claim calls for means for controlling the level of error detection. The specification of the Applicant in Figures 7a-7d shows various levels of error correction. Kuzma may have error detection, but it is silent about controlling the level of error detection.

Each of Claims 9-18 is independently patentable over the art of record. The office actions admit that the limitations identified in each of claims 9-18 is not shown in any reference. In order to reject a claim, the prior art must show all the elements of the claim, even when the rejection is made under 35 USC 103. See MPEP 2143.03. In order to make a *prima facie* case of obviousness, **every** limitation claimed in each of the Claim 9-18 must be found or suggested in the prior art. Claims 9-18 are directed to specific frame structures. No reference shows or suggests any one of the frame structures that are in the claims. Unless the claimed limitation is found in some reference, it cannot be anticipated or obvious.

The rejection finds that one skilled in the art would have "no difficulty" in making the frame structures of Claims 9-18. Perhaps that is correct, but it is **not** the standard for patentability. The difficulty in making an invention is irrelevant. Once the inventor has shown the invention, others can (and often do) readily copy it. Indeed, 35 USC 112, first paragraph, mandates that the inventor describe the invention well enough so that others skilled in the art may reproduce the invention. In contrast, the issue is whether or not the prior suggests the particular combination set forth in the claims. Here the prior art suggests neither the species (Claims 9-18) nor the genus (Claim 1).

Claims 19, 20 and 23-30 are patentable over the combination of Kuzma, Peters (US 5577190) and Rostoker et al. (US 5784572). Those claims were rejected on grounds that Kuzma shows all the elements of those claims except for selected elements identified in Peters and Rostoker.

The rejection is erroneous because it is based on an erroneous finding about what is shown in Kuzma. Claim 19 and claim 29 both call for **three** DSPs to perform the respective tasks of (a) video compression, (b) video decompression, and (c) audio compression and decompression. Thus, two DSPs are dedicated to video and one to audio. The art relied on by the rejection does not have three DSPs for converting between analog and digital and for compressing and decompressing.

The Kuzma reference has only one processor, a host processor 160. It has **two** conventional codecs. One handles video (500) the other handles audio (185). Kuzma's video codec 500 has only one algorithm, CLI PV2. See column 1, line 23. For reasons not

explained, the rejection insists that there are two DSPs in the video codec 500. In fact, there are no DSPs in that in codec 500. It is a simple, conventional, one-algorithm codec.

Claims 19 and 29 call for means for periodically refreshing the image. The rejection erroneously relies upon Figure 2 of Kuzma. That reliance is misplaced. Kuzma is silent regarding refreshing images.

Claims 19 and 29 call for multiple compression and decompression algorithms on all three DSPs. Kuzma fails to show the three DSPs. Assuming, *arguendo*, that there are three DSPs, Kuzma still fails to show multiple algorithms on each DSP. The rejection broadly points to columns 5-7 of Kuzma to show the multiple algorithms on each DSP. However, close scrutiny of Kuzma shows Kuzma's video codec 500 has only one algorithm, CLI PV2. See column 1, line 23. Kuzma does not identify any specific algorithm for audio signals and does not disclose multiple audio algorithms.

Claims 24 and 25 call for means for randomizing and derandomizing data. The rejection erroneously relies upon Kuzma at column 6, lines 9-37 to reject the claims. Randomizing and derandomizing are part of the encryption function of the invention that secures data from interception by an enemy. Kuzma is silent about encryption and about randomizing data. It appears the rejection equates a multiplexer to an encryption or randomizing device. However, the rejection provides no support for making such a finding. Absent support in the reference itself or another reference, it is improper to base a rejection upon an unsupported allegation of equivalence.

In summary, the rejection is fatally defective for failing to identify references that show the limitations of the independent claims and many dependent claims. The references do not show the byte sequence of independent Claim 1 and dependent Claims 9-18and they do not show the three DSPs of independent Claims 19 and 29. An order reversing the rejection is respectfully requested.

Respectfully requested,

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APPENDIX

1. A narrowband video codec for generating an output stream of control, data, and error correction bits, said narrowband codec comprising:

means for framing the output, control and data bits into a series of sequential frames of bytes for transmission over an rf link of a controlled frequency wherein each frame comprises an identical sequence of bytes;

each frame comprising, in sequence:

two control bytes;

a plurality of sequential sets of data bytes,

each set of data bytes comprising:

a sequence of at least one audio byte and a plurality of video bytes, at least one of said plurality of video bytes between each sequential audio byte, each set of data bytes having its audio and video bytes in the same order as each other set of data bytes; and

a plurality of error correction bytes.

2. The narrowband video codec of claim 1 wherein each set of data bytes has the same number of video bytes between sequential audio bytes.

3. The narrowband video codec of claim 1 wherein the control bytes include data bit signals representative of the number of bytes in the frame.

4. The narrowband codec of claim 1 further comprising means for periodically refreshing the decompressed video image.

5. The narrowband codec of claim 1 further comprising means for controlling of the level of error correction without re-transmitting corrupted data.

6. The narrowband codec of claim 1 further comprising means for synchronizing the frames to the data rate of the rf link.

7. The narrowband codec of claim 1 further comprising a battery power supply.

8. The narrowband codes of claim 7 wherein the power supply voltage is between 18 and 36 volts.

9. The narrowband video codec of claim 1 wherein each frame comprises 200 bytes including two control bytes, 180 data bytes and 18 error correction bytes.

10. The narrowband video codec of claim 1 wherein each frame comprises 150 video bytes and 30 audio bytes.

11. The narrowband video codec of claim 10 wherein sequential audio bytes are separated from each other by five video bytes.

12. The narrowband video codec of claim 9 wherein each frame comprises 165 video bytes and 15 audio bytes.

13. The narrowband video codec of claim 10 wherein sequential audio bytes are separated from each other by eleven video bytes.

14. The narrowband video codec of claim 1 wherein each frame comprises 40 bytes including two control bytes, 18 data bytes and 20 error correction bytes.

15. The narrowband video codec of claim 14 wherein each frame comprises 12 video bytes and 6 audio bytes.

16. The narrowband video codec of claim 15 wherein sequential audio bytes are separated from each other by two video bytes.

17. The narrowband video codec of claim 14 wherein each frame comprises 15 video bytes and 3 audio bytes.

18. The narrowband video codec of claim 15 wherein sequential audio bytes are separated from each other by five video bytes.

19. A narrowband video codec for transmitting and receiving compressed video and audio data signals over a rf link comprising:

a first digital signal processor for converting analog video signals into digital video signals and for compressing the digital video signals into video bytes;

a second digital signal processor for decompressing received digital video bytes into digital video signals and for converting the decompressed digital video signals into analog video signals;

a third digital signal processor for converting analog audio signals into digital audio signals, for compressing the digital audio signals into audio bytes, for decompressing received audio bytes into digital audio signals, and for converting the decompressed digital audio signals into analog audio signals;

means for periodically refreshing the transmitted video signals;

means for running multiple compression and decompression algorithms on all three digital signal processors;

a solid state memory; and

means for emulating a disk access system of a computer using solid state memory components to store file sequences with compression/decompression algorithm data.

20. The narrowband video codec of claim 19 wherein the period for video image refreshing is thirty seconds.

21. The narrowband codec of claim 19 further comprising a battery power supply.

22. The narrowband codec of claim 21 wherein the power supply is between 19 and 36 volts.

23. The narrowband codec of claim 19 further comprising means for sensing the data rate of the rf link and for transmitting and receiving data frames in accordance with the data rate of the rf link.

24. The narrowband codec of claim 19 further comprising means for randomizing data in order to maximize the efficiency of data transmission over the rf link.

25. The narrowband codec of claim 19 further comprising means for de-randomizing data from the rf link without introducing additional bit errors.

26. The narrowband video codec of claim 19 further comprising means for selecting one of a plurality of video resolution and clarity modes.

27. The narrowband codec of claim 26 wherein said video resolution modes include a low resolution mode and a high resolution mode.

28. The narrowband codec of claim 26 wherein said video clarity modes include a low clarity mode, a high clarity mode, and an intermediate clarity mode.

29. A narrowband video codec for transmitting and receiving compressed video and audio data signals over a rf link comprising:

a first digital signal processor for converting analog video signals into digital video signals and for compressing the digital video signals into video bytes;

a second digital signal processor for decompressing received digital video bytes into digital video signals and for converting the decompressed digital video signals into analog video signals;

a third digital signal processor for converting analog audio signals into digital audio signals, for compressing the digital audio signals into audio bytes, for decompressing received audio bytes into digital audio signals, and for converting the decompressed digital audio signals into analog audio signals;

means for periodically refreshing the transmitted video signals;

means for running multiple compression and decompression algorithms on all three digital signal processors;

a solid state memory;

means for emulating a disk access system of a computer using solid state memory components to store file sequences with compression/decompression algorithm data; and

a memory for storing a program connected to at least the third digital signal processor, said memory comprising at least two audio conversion programs for converting audio at first and second respective rates.

30. The narrowband codec of claim 29 further comprising means for automatically selecting one of said audio conversion programs in accordance with the data rate of the rf link.